REMARKS

In accordance with the foregoing, independent claims 1, 14, and 15 have been amended, and claims 1 and 4-26 are pending and under consideration. No new matter is presented in this Amendment.

REJECTIONS UNDER 35 U.S.C. §103:

Claims 1-3, 9-15, 20-23 and 26 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamasaki et al. (U.S. Patent Application Publication No. 2003/0143407), hereinafter "Yamasaki." The rejections are maintained in the Advisory Action dated November 5, 2009 for reasons alleged therein.

The Applicants respectfully traverse the rejection and request reconsideration. Applicant s respectfully submit that independent claims 1, 14 and 15 have been amended for further clarity and not in response to outstanding rejections. In particular, Applicants submit that the Office ap pears not to have addressed each and every argument presented in Applicants' Amendment dat ed October 14, 2009 in its Advisory Action.

Should the rejection be maintained in view of the remarks below, Applicants kindly request that Office provide specific citations in alleged art for disclosing each and every claimed feature and substantively address each and every arguments presented herein so that the matter may be appropriately responded by the Applicants and/or issue clarified for an appeal. It is submitted that Yamasaki et al. fails to disclose or suggest each and every claimed feature, and accordingly, a prima facie case of obviousness has not been established. Withdrawal of the rejection and allowance of the pending claims are earnestly requested.

As an initial matter and for background purpose only, the exemplary pattern forming material and the method of forming a pattern using the pattern forming material according to teaching provided by the Applicants in the specification, among other things, **makes it possible to form patterns finer than the diffraction limit of an optical system using the first activation light with a high aspect ratio without increasing the output power of the activation light**, as shown in paragraphs [0019] ~ **[0022]** and **Fig. 2**, by adopting, for example, at

least two light-to-heat converting layers sandwiching the thermal sensitive material layer that enable the activation light to be more efficiently converted into heat even at a low output power and the Gaussian temperature distribution of the light-to-heat converting layers that renders a reaction region narrower than the spot diameter of the activation light (cf. paragraph [0022] and Fig. 2).

The Office appears to assert that the sandwich structure would have been obvious because *Yamasaki* "definitely" suggest a light to heat converting material in plural layers above and below the imaging layer (recording layer) on the basis of the description in paragraph [**0282**] of *Yamasaki*, which teaches a light to heat converting material in layers can be comprised in the undercoat layer just below the imaging layer, or in a water-soluble overcoat layer.

However, Yamasaki only teaches that a light to a heat converting material may be comprised in plural layers such as the image forming layer, the surface layer of the substrate or the substrate itself, the undercoat layer, the overcoat layer, an intermediate layer or back coat layer in paragraphs [0038], [0185], [0282] and [0318] to improve IR absorption efficiency and thus sensitivity. Yamasaki does not teach or even suggest the feature of the sandwich structure in which the thermal sensitive material layer is interposed between the first and second light-to-heat converting layers and the first and second light-to-heat converting layers to form a pattern finer than the diffraction limit of an optical system using the first activation light in the thermal sensitive material layer; and the unexpected technical effect of *forming patterns finer than the diffraction limit of an optical system using the first activation light*.

Yamasaki even teaches away by suggesting adding a light to heat converting material to the image forming layer corresponding to the thermal sensitive material layer. If this happens, it may prevent Gaussian temperature distribution of the light-to-heat converting layers from being narrower than the spot diameter of the activation light, thereby unable to obtain patterns finer than the diffraction limit of an optical system.

Accordingly, Yamasaki fails to disclose or suggest, among other things, a "pattern forming material comprising: a thermal sensitive material layer formed on a target substrate; a first light-to-heat converting layer formed between the thermal sensitive material layer and the target substrate; and a second light-to-heat converting layer formed on a surface of the thermal sensitive material layer opposite to the first light-to-heat converting layer, wherein the thermal sensitive material layer is interposed between the first and second light-to-heat converting layers and the

first and second light-to-heat converting layers comprise Ge-Sb-Te alloys; Ag-In-Sb-Te alloys; Ag-In-Sb-Te-V alloys; lithium niobate; methylnitro aniline; or any combinations thereof, and wherein the first and second light-to-heat converting layers absorb a first activation light radiated thereon and convert the absorbed activation light into heat, whereby a pattern finer than the diffraction limit of an optical system using the first activation light is formed in the thermal sensitive material layer," (emphasis added) as recited in independent claim 1 and similarly recited in independent claims 14 and 15.

As noted above, independent claim 1 further recites "the first and second light-to-heat converting layers comprise Ge-Sb-Te alloys; Ag-In-Sb-Te alloys; Ag-In-Sb-Te-V alloys; lithium niobate; methylnitro aniline; or any combinations thereof, and wherein the first and second light-to-heat converting layers absorb a first activation light radiated thereon and convert the absorbed activation light into heat," in addition to the claim's recitation of the thermal sensitive material layer being interposed between the first and second light-to-heat converting layers.

Again, by way of review, Yamasaki discloses a pattern formed on an image forming layer by ink (paragraph [0198]). Specifically, Yamasaki discloses a planographic printing plate precursor that includes an image forming layer (paragraph [0128]) and a light to heat converting substance (paragraph [0185]). Accordingly, when the precursor is treated through laser light, the light to heat converting substance converts the light to heat energy that is applied to the image forming layer (paragraph [0185]). As a result, a heated region of the image forming layer changes from hydrophilic to hydrophobic or from hydrophobic to hydrophilic (paragraph [0194]). Subsequently, when the precursor receives water and ink in a printer, a pattern is formed by the ink in the hydrophobic ink-receiving image area (paragraph [0194]).

The Office concedes that Yamasaki does not teach light-to-heat converting material above and below a thermal sensitive layer. Rather, the Office states that such an arrangement would have been obvious because Yamasaki teaches the light to heat conversion material may be in any position of the thermal-sensitive composition. However, though Yamasaki does suggest that a plurality of locations may include the light to heat conversion material according to various embodiments to improve sensitivity, Yamasaki **does not teach light to heat conversion layers sandwiching the image forming layer having the light to heat conversion material in a single embodiment to form patterns.**

Again, Yamasaki does not relate to creating patterns that require large amounts of heat (for example, to create very fine patterns finer than the diffraction limit of the activation light and having a high aspect ratio), and does not include a photoresist or heat sensitive layer that could evaporate or deform by larger amounts of heat that are not efficiently converted and provided. Meanwhile, the present claim recites two light-to-heat converting layers, which comprise Ge-Sb-Te alloys; Ag-In-Sb-Te alloys; Ag-In-Sb-Te-V alloys; lithium niobate; methylnitro aniline; or any combinations thereof and thus enable the activation light to be more efficiently converted into heat even at a low output power. As a result, according to the present claim, it is possible to form patterns finer than a diffraction limit of the activation light with a high aspect ratio without increasing the output power of the activation light.

However, there is no conceivable reason to include two heat conversion layers sandwiching the image forming layer in Yamasaki, as Yamasaki does not relate to creating very fine patterns that require large amounts of heat. Yamasaki teaches as a light to heat conversion material various pigments and dyes in paragraphs [0265] to [0272] and simple metals or alloys of Si, Al, Ti, V, Cr, Mn, Fe, Co, Ni, and so forth in paragraph [0274]. However, Yamasaki does not teach Ge-Sb-Te alloys; Ag-In-Sb-Te alloys; Ag-In-Sb-Te-V alloys; lithium niobate; methylnitro aniline; or any combinations thereof, which are different from the metals or alloys listed in Yamasaki. To the extent that the Office asserts the light to heat conversion material is contained in the image forming layer, it is not possible to form patterns in the image forming layer corresponding to the thermal sensitive material layer (for example, finer than a diffraction limit of the activation light with a high aspect ratio), without increasing the output power of the activation light because the chemical reaction region in the image forming layer would be wider than the spot diameter of the laser light, as explained in paragraph [0022] of the detailed description. Moreover, to the extent that the Office states that multiple light to heat converting layers would have been obvious due to a benefit to the precursor of Yamasaki because an image is formed faster than with only one light to heat converting layer, it is respectfully noted that forming an image faster has nothing to do with forming a pattern finer than a diffraction limit of the activation light with a high aspect ratio without increasing the output power of the activation light. Also, while the Office cites paragraph [0264] of Yamasaki, which states, “at least one light to heat converting layer” to convert optical energy to heat energy, it is noted that Yamasaki only teaches in paragraph [0264] that, “it is desirable that at least one layer comprised in the precursor contains a light to heat converting

agent having the ability to convert optical energy to heat energy."

Therefore, as Yamasaki also does not disclose or even suggest two heat conversion layers comprising "Ge-Sb-Te alloys; Ag-In-Sb-Te alloys; Ag-In-Sb-Te-V alloys; lithium niobate; methylnitro aniline; or any combinations thereof" and sandwiching the image forming layer and there is no benefit or reason to include such two heat conversion layers in the planographic precursor of Yamasaki, the Applicants respectfully submit that Yamasaki fails to disclose, implicitly or explicitly, a thermal sensitive material layer interposed between first and second light-to-heat converting layers, as recited in claim 1 and similarly recited in claims 14 and 15. Moreover, the Office states that the recitation, "wherein the first and second light-to-heat converting layers absorb a first activation light radiated thereon and convert the absorbed activation light into heat," is a process limitation and does not add a positive recitation to the claim. However, the limitation is not a process limitation but a property limitation such that it should be regarded as having patentable weight since the first and second light-to-heat converting layer are not fabricated by the act of absorbing a first activation light radiated thereon and converting the absorbed activation light into heat.

As additional background purpose only, Applicants note an unexpected result obtainable by the pattern forming material having the thermal sensitive material layer sandwiched by the first and second light-to-heat converting layers, as taught by Applicants' specification.

Regarding the rejection of claims 9-13, in addition to features recited therein, it is noted that these claims depend from independent claim 1 and are, therefore, allowable for at least the reasons set forth above.

Regarding the rejection of independent claim 14, it is noted that claim 14 recites some substantially similar features as claim 1. Thus, in addition to features recited therein, the rejection of this claim is also traversed for similar reasons as set forth above.

Regarding the rejection of independent claim 15, it is noted that claim 15 is allowable for at least similar reasons as those provided above with reference to claim 1. Furthermore, it is noted that claim 15 recites "removing a non-pattern portion of the thermal sensitive material layer." In contrast, Yamasaki discloses a planographic printing plate precursor that includes an image forming layer (paragraph [0128]) and a light to heat converting substance (paragraph [0185]). Accordingly, when the precursor is treated through laser light, the light to heat converting

substance converts the light to heat energy that is applied to the image forming layer (paragraph [0185]). As a result, a heated region of the image forming layer changes from hydrophilic to hydrophobic or from hydrophobic to hydrophilic (paragraph [0194]). Subsequently, when the precursor receives water and ink in a printer, a pattern is formed by the ink in the hydrophobic ink-receiving image area (paragraph [0194]). **However, the non-image area that does not receive ink (i.e., the hydrophilic area) is not removed, and is an integral part of the precursor that is inserted into a printer**. Furthermore, the Examiner states that the dampening water is removed from the precursor and the non-image area is therefore removed. However, this is not true. Yamasaki relates to a planographic printing plate precursor and planographic printing means printing from **a flat surface**, as opposed to a raised surface (as with relief printing) or an incised surface (as with intaglio printing). Lithography and offset lithography are planographic processes that utilize the property that water will not mix with oil. Therefore, the non-image area is not removed in Yamasaki. Therefore, the Applicants respectfully submit that Yamasaki fails to disclose, implicitly or explicitly, a removing of a non-pattern portion of a thermal sensitive material layer, as recited in claim 15.

Regarding the rejection of claim 20, in addition to features recited therein, it is noted that this claim depends from claim 1 and is, therefore, allowable for at least the reasons set forth above.

Regarding the rejection of claim 21, in addition to features recited therein, it is noted that this claim depends from claim 10 and is, therefore, allowable for at least the reasons set forth above.

Regarding the rejection of claims 22-23, it is noted that these claims have been amended to depend from claim 15 and are, therefore, allowable for at least the reasons set forth above. Moreover, the recitation in claim 22, “wherein the thermal sensitive material layer changes properties due to heating or activation light irradiation, allowing a pattern to appear through a development process,” and in claim 23 “wherein at least two surfaces of the thermal sensitive material layer are heated, enabling a high aspect ratio pattern to be formed” should be considered since the claims, as amended, are method claims.

Regarding the rejection of claim 26, in addition to features recited therein, it is noted that this claim has been amended to depend from claim 1 and is, therefore, allowable for at least the reasons set forth above.

Claims 1, 4-8, 16, 18-19 and 25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamasaki et al. (U.S. Patent Application Publication No. 2003/0143407) in view of Takeda et al. (U.S. Patent No. 5,858,604). The Applicants respectfully traverse the rejection and request reconsideration.

Regarding the rejection of independent claim 1, it is noted that Yamasaki fails to teach or suggest the novel features of independent claim 1 as noted above. Takeda, on the other hand, is relied upon for at teaching of features other than those discussed above and furthermore fails to teach or suggest the novel features of independent claim 1. Accordingly, Takeda fails to cure the deficiencies of Yamasaki. Accordingly, the Applicants respectfully submit that claim 1 is allowable because neither Yamasaki nor Takeda, whether taken singly or combined, teach or suggest the novel features of independent claim 1.

Regarding the rejection of claims 4-8, in addition to features recited therein, it is noted that these claims depend from claim 1 and are, therefore allowable for at least the reasons set forth above.

Regarding the rejection of claims 16, 18-19, and 25, in addition to features recited therein, it is noted that these claims depend from claim 15 and are, therefore, allowable for at least the reasons set forth above.

Claims 16, 17 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamasaki et al. (U.S. Patent Application Publication No. 2003/0143407) in view of Takeda et al. (U.S. Patent No. 5,858,604) and further in view of Kouchiyama et al. (Storage Technology Laboratories). The Applicants respectfully traverse the rejection and request reconsideration.

Regarding the rejection of claims 16, 17, and 24, it is noted that these claims depend from claim 15 and as noted above, Yamasaki fails to teach or suggest the novel features of independent claim 15.

Takeda and Kouchiyama, on the other hand, are relied upon for a teaching of features other than those discussed above with respect to Yamasaki, and furthermore fail to teach or suggest the novel features discussed above. Accordingly, Takeda and Kouchiyama fail to cure the deficiencies of Yamasaki.

Accordingly, in addition to features recited therein, the Applicants respectfully submit that claims 16, 17 and 24 are allowable, at least because of their dependency from claim 15 and

because neither Yamasaki, Takeda nor Kouchiyama, whether taken singly or combined, teach or suggest the novel features of independent claim 15.

Based on the foregoing, this rejection is respectfully requested to be withdrawn.

Again, should the rejection be maintained in view of the remarks above, Applicants kindly request that Office provide specific citations in alleged art for disclosing each and every claimed feature and substantively address each and every arguments presented above so that the matt er may be appropriately responded by the Applicants and/or issue clarified for an appeal. It is s ubmitted that Yamasaki et al. and other alleged references fail to disclose or suggest each and e very claimed feature, and accordingly, a prima facie case of obviousness has not been establish ed. Withdrawal of the rejection and allowance of the pending claims are earnestly requested.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Respectfully submitted,

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